

Utah EMS Protocol Guidelines: Trauma



UTAH DEPARTMENT OF
HEALTH

January 1, 2017

Trauma Patient Care Guidelines

These guidelines were created to provide direction for each level of certified provider in caring for trauma patients. All of these directions, dosages, and provisions are subject to change with later notice or revision of the guidelines. The OLMC physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OLMC physician these should be documented and brought to the attention of the physician at the receiving hospital. If the explanation is not sufficient, the provider should bring the issue to their medical director or the BEMSP for review.

General Approach to Trauma Patient Care Guidelines

- Assess your patient prior to initiating a guideline.
- Destination decisions for trauma patients should be in accordance with the ***Utah Trauma Field Triage Guidelines***.
- Early notification allows the receiving physician to activate the receiving hospital's trauma alert system.
- Providers should describe: vital signs, including GCS/AVPU, injuries, mechanism of injury and any complicating factors that will affect treatment (as per the ***Utah Trauma Field Triage Guidelines***) so that the hospital may activate the appropriate level of trauma response.
- Consider air transport for critically injured patients with long transport times to a trauma center (over (60 minutes).
- Consider delivery to the nearest hospital if your patient is unstable for a prolonged transport or the patient has a compromised airway that you cannot secure.
- More than one guideline may apply.
- If conflicts arise between treatment guidelines, contact OLMC for clarification.
- Providers may provide treatment up to the level of their certification only.
- Air Medical Transport Service personnel function under their own clinical guidelines.
- Contact your receiving hospitals and OLMC as soon as clinically possible for each patient.
- OLMC with a physician may change your treatment plan.
- Any variations to a guideline by the OLMC physician should be clarified to ensure that the provider has properly characterized the situation.
- The OLMC Physician has the final word on treatment once contact is made.
- The OLMC Physician must approve usage of dosages in excess of the guidelines.

General Pediatric Considerations

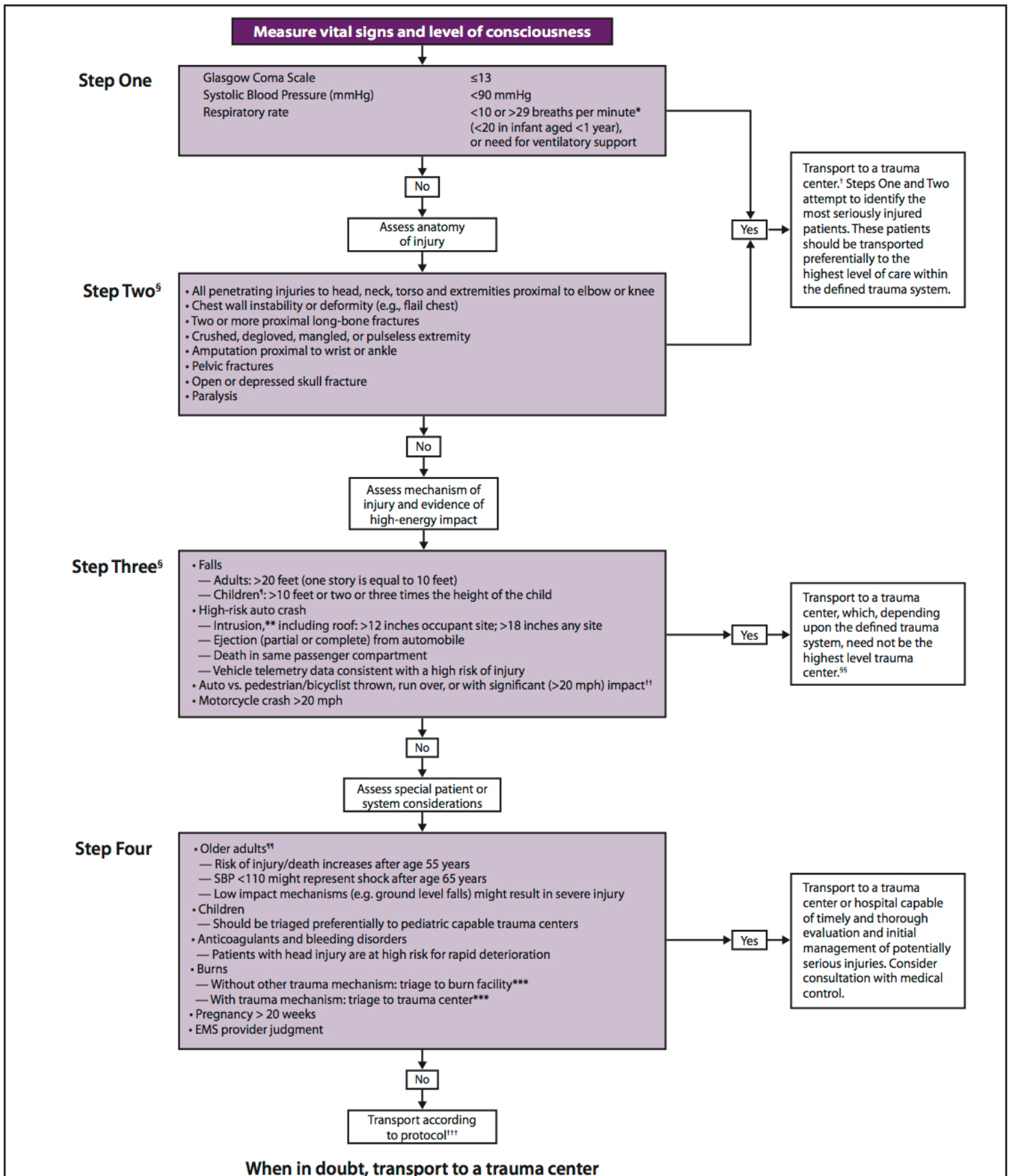
- Pediatric reference tape-based dosing is preferred over calculated doses for infants and children.
- Pediatric lowest acceptable systolic blood pressures are: birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg. These are the blood pressures to use for Pediatrics (<15 years old) under step one of the Utah Trauma Field Triage Guidelines.

Table of Contents

| | |
|---|---------|
| 1. Utah Trauma Field Triage Guidelines..... | Page 3 |
| 2. Guidelines for Transport of Trauma Patients to Freestanding E.D.s..... | Page 4 |
| 3. General Trauma Management..... | Page 5 |
| 4. Amputations/Tooth Avulsions..... | Page 7 |
| 5. Burns – Thermal/Electrical/Lightning..... | Page 8 |
| 6. Head Injury (Traumatic Brain Injury)..... | Page 11 |
| 7. Hemorrhage Control, Extremity and Crush Injuries..... | Page 13 |
| 8. Non-Accidental Trauma/Abuse..... | Page 15 |
| 9. Snake Bites..... | Page 16 |
| 10. Selective Spinal Immobilization..... | Page 17 |

① This symbol and yellow highlighted instructions precedes any treatment that requires OLMC prior to initiating the treatment unless otherwise specified.

Utah Trauma Field Triage Guidelines



Utah Trauma System Advisory Committee

Guidelines for Transport of Trauma Patients to Freestanding Emergency Departments

The following types of patients are NOT candidates for transport to a freestanding ED (FSED):

1. Critically-injured patients with unstable vital signs or other life-threatening conditions UNLESS the patient's airway is not maintainable with EMS advanced or basic airway management techniques and the FSED is the closest ED
2. Traumatic cardiac arrest patients
3. Patients meeting Steps 1-3 criteria of the Utah Trauma Field Triage Guidelines.
4. Patients with head injuries who are over 65 years old OR who are taking anticoagulants
5. Patients with angulated long bone fractures
6. Patients with suspected open fractures or dislocations
7. EMS provider judgement

These guidelines may be modified during a disaster situation

GENERAL TRAUMA MANAGEMENT

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ Continuous cardiac monitoring, ETCO₂, and pulse oximetry, when available
- ❑ **Treatment Plan**

Primary Survey:

- ① Hemorrhage Control: Assess for and stop severe hemorrhage
- ① Airway:
 - Assess airway patency, ask patient to talk to assess stridor and ease of air movement
 - Evaluate for injuries that may lead to airway obstruction including unstable facial fractures, expanding neck hematoma, blood or vomitus in the airway, facial burns/inhalation injury
 - Evaluate mental status for ability to protect airway (AVPU="P" or "U" or GCS <8). These patients will require airway protection.
 - Establish a patent airway (with cervical spine precautions)
- Breathing:
 - Assess respiratory rate and pattern, symmetry of chest wall movement, and presence of breath sounds bilaterally
 - If absent or diminished breath sounds in a hypotensive patient, consider tension pneumothorax
 - For open chest wound, place an occlusive dressing sealed on 3 sides
- Circulation:
 - Assess vital signs / check for radial pulse
 - If pelvis is unstable, place pelvic binder or sheet to stabilize pelvis
- Disability (quick neurologic evaluation)
 - Assess pupils, motor movement of extremities, and mental status (AVPU)
- Exposure/Environment:
 - Rapid evaluation of entire body (including back) to assess for injuries
 - Prevent hypothermia
- ① Treat for pain and anxiety per the ***Pain and Anxiety Management Guideline***.

❑ Key Considerations

- ① Scene times should be as short as possible for severely injured patients (Goal: 10 minutes). Perform required procedures enroute to the trauma center.
- ① Severely injured trauma patients should be preferentially transported to a trauma center, as per the ***Field Trauma Triage Guideline***.
- ① **Withholding and termination of resuscitative efforts**
 - Resuscitative efforts should be withheld for trauma patients with the following:
 - Decapitation
 - Hemicorporectomy
 - Signs of rigor mortis or dependent lividity
 - Blunt trauma patients who are apneic, pulseless, and have no organized activity on the cardiac monitor
 - Resuscitative efforts may be terminated in patients with traumatic arrest who have no return to spontaneous circulation after 15-30 minutes of resuscitative efforts, including minimally interrupted CPR
- ① Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

AEMT

- ❑ Establish vascular access and begin fluid therapy per ***IV/IO Access*** and ***Shock and***

AEMT

- ❑ Vascular access and fluid therapy per ***IV/IO Access*** and ***Shock and Fluid Therapy***

Fluid Therapy Guidelines

- ❑ **Suspected Tension Pneumothorax:** Evidence of chest trauma + hypotension:
 - Immediate needle decompression of affected side
- ❑ **Traumatic Arrest**
 - Consider bilateral needle decompression based on mechanism of injury

PARAMEDIC

Guidelines

- ❑ **Suspected Tension Pneumothorax:** Evidence of chest trauma + hypotension:
 - Immediate needle decompression of affected side
- ❑ **Traumatic Arrest**
 - Consider bilateral needle decompression based on mechanism of injury

PARAMEDIC

AMPUTATIONS / TOOTH AVULSIONS

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ Cardiac monitor, ETCO₂, and pulse oximetry monitoring, when available
- ❑ **Treatment Plan**
 - Maintain airway, apply oxygen as needed to maintain SaO₂ 90-94%.
 - Unless this is an isolated injury, consider spinal motion restriction per the **Selective Spinal Immobilization Guideline**.
 - Treat for pain and anxiety per the **Pain and Anxiety Management Guideline**.
 - Monitor closely for signs of shock, especially in amputations above the wrist or ankle.

Amputated Body Parts and/or Tissue

- Apply direct pressure to control hemorrhage. A tourniquet is frequently required to control hemorrhage from amputation or near-amputation, when direct pressure is ineffective or impractical.
 - If amputation is incomplete, cover stump with sterile dressing saturated in NS, splint affected digit or limb in baseline physiologic position.
 - All easily retrievable tissue should be transported.
 - Rinse part(s) with NS.
 - Wrap tissue in sterile gauze moistened with NS.
 - Place tissue into plastic bag or container.
 - Place bag/container into separate container filled with ice (if available)
 - Do not allow tissue to come into direct contact with ice, do not freeze, and do not submerge in water.

Tooth Avulsion

- If tooth is out over 30 minutes, broken, or cannot be re-implanted on scene.
 - Handle tooth by chewing surface only (avoid touching the root).
 - Rinse with water. Do not scrub, dry, or wrap tooth in tissue or cloth.
 - Place tooth in container of (**in order of preference**)
 - Patient's saliva (place in patient's mouth, if patient awake and alert)
 - Alternatively, it may be placed in a container with milk or normal saline
- If tooth is out less than 30 min, you may attempt re-implantation (only permanent teeth) on scene (Primary or "baby" teeth should not be re-implanted).
 - Do not try to re-implant if more than 2 teeth are involved.
 - The tooth must be cleanly avulsed with the entire root present.
 - Only re-implant if it is one of the front 6 upper or lower teeth.
 - Patient must be conscious and cooperative.
 - Gently insert tooth back into the appropriate location without forcing it. Do not worry about positioning well.

❑ **Key Considerations**

- Consider transportation of extremity amputation patients directly to a trauma center.

ADULT

AEMT

Advanced airway, vascular access and fluid therapy per **IV/IO Access** and **Shock and Fluid Therapy Guidelines**

PARAMEDIC

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

AEMT

Advanced airway, vascular access and fluid therapy per **IV/IO Access** and **Shock and Fluid Therapy Guidelines**

PARAMEDIC

BURNS – THERMAL / ELECTRICAL / LIGHTNING

ALL PROVIDERS / EMT

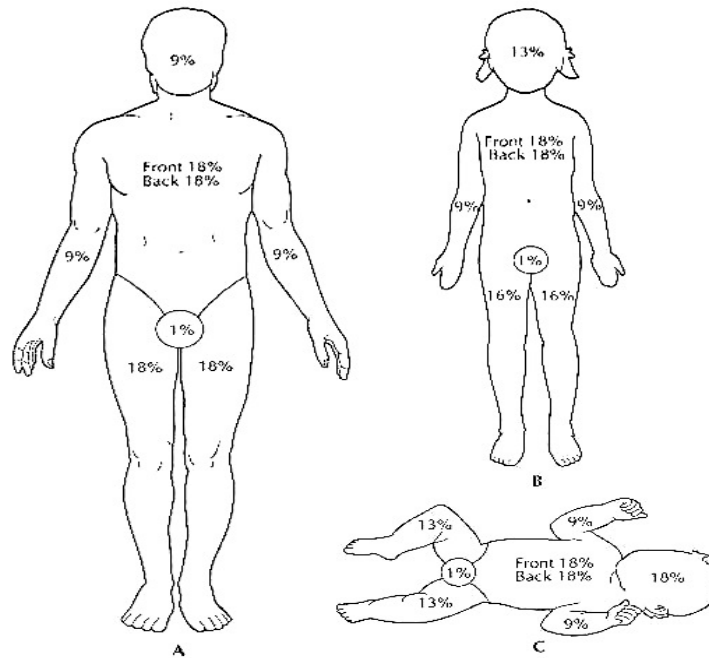
- ❑ Scene and patient management
 - Thermal Burns
 - Stop the burning process.
 - Do not pull material out of the wound but cut clothing around it.
 - Electrical Burns
 - Safely evacuate patient from electrical source.
 - Do not touch the patient until you are sure that the electrical source is disconnected.
 - When multiple patients are struck simultaneously by lightning or a high voltage source, those in respiratory and/or cardiac arrest should be given the highest priority of care, even those who appear dead on initial evaluation. These patients may be in ventricular fibrillation and resuscitated with CPR and defibrillation.
- ❑ Focused history and physical exam
 - Identify potential entry and exit wounds for electrical burns – both sites will generally be a full thickness burn site.
- ❑ Cardiac monitor, ETCO₂, and pulse oximetry monitoring, when available. Avoid placing monitor attachments over burned skin if possible.
- ❑ **Treatment Plan**
 - Initiate early oxygen therapy with high flow O₂.
 - In the unconscious patient, implement spinal motion restriction per the **Selective Spinal Immobilization Guideline**.
 - If patient in shock, fluid resuscitation as per **Shock and Fluid Therapy Guideline** (AEMT/Paramedic)
 - With electrical burns anticipate heart rhythm irregularities.
 - Assess for circulatory compromise from circumferential extremity burns or ventilator compromise from circumferential chest burns.
 - Remove items that may constrict swelling tissue.
 - Estimate size and depth of burn using the percentage chart (below).
 - Dressings: Cover burns with dry dressings.
 - Closely monitor patient's temperature and prevent hypothermia.
 - Treat for pain and anxiety per the **Pain and Anxiety Management Guideline**.
 - Burn patients with major trauma should be transported to a trauma center as per the Utah Trauma Field Triage Guideline
 - Consider air ambulance transportation for long transport times, inability to control pain after maximal doses of analgesics, and airway concerns that might necessitate advanced airway management
 - Consider transport directly to a designated burn center for the following:
 - Inhalation injuries
 - Partial or Full Thickness (2nd or 3rd degree) burns (>20% BSA in adults or >15% in pediatrics).
 - Circumferential burns
 - Partial or full thickness burns involving face, hands, or genitalia
- ❑ **Cyanide or carbon monoxide (CO) poisoning**
 - Signs: muscular weakness, confusion, agitation, unconsciousness, or profound shock
 - Most common in closed-space fires
 - Apply 100% NRB oxygen
- ❑ **Key Considerations**
 - Electrical Burns are frequently more serious than they appear.
 - Identifying the source as AC or DC voltage with the amperage will be helpful in the treatment.
 - Consider 12-lead ECG for patients with electrical burns
 - Care for traumatic injuries should precede care for the burn.
 - If patient is initially hypotensive after burn (first hour), it is NOT a result of the burn: strongly suspect underlying trauma.
 - Keep patients warm! Patients are prone to hypothermia due to heat loss from the burns.
 - Consider Child Abuse as a cause. Circumferential scald burn to hands, feet, buttocks, and genitalia are common burns seen in child abuse (especially in children <5 years old)
 - Do not overhydrate patients with IV fluid. See proper fluid rates for burns below.
 - Definitions:
 - Superficial (1st Degree) Burns – red, painful, without blisters.

- Partial Thickness (2nd Degree) Burns – red, painful/hypersensitive, swollen, with either intact or ruptured blisters.
- Full Thickness (3rd Degree) Burns – dark, leathery, painless, waxy, and does not blanch.

❑ **Parkland Formula**

- 4 ml X weight (kg) X %BSA = total fluid (ml) to be administered in 24 hrs
- 1/2 of total should be given in first 8 hrs, the remainder in the next 16 hrs

❑ **Calculation of Burn Surface Area (%BSA): based only on 2nd and 3rd degree burn totals**



ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

AEMT

- ❑ Advanced airway, vascular access per **IV/IO Access** and **Fluid Therapy Guidelines**
 - If possible, avoid placing IV through burned skin
- ❑ **IV Fluid therapy:** If 2nd + 3rd degree >10% BSA begin:
 - LR or NS at 500 cc/hr (no bolus)
 - If time from burn is >30 min, begin fluids using Parkland Formula

AEMT

- ❑ Advanced airway, vascular access per **IV/IO Access** and **Shock and Fluid Therapy Guidelines**
 - If possible, avoid placing IV through burned skin
- **IV Fluid therapy:** If 2nd or 3rd degree >10% BSA begin:
 - LR or NS infusion rates (no bolus)
 - <5 years old: 125 cc/hr
 - 5-13 years old: 250 cc/hr
 - >13 years old: 500 cc/hr
 - If time from burn is >30 min, begin fluids using Parkland Formula

PARAMEDIC

PARAMEDIC

- ❑ If evidence of possible airway burn (singled nasal hair, carbonaceous sputum, hoarse voice, or stridor), consider early intubation
- ❑ If signs of cyanide toxicity present:
hydroxycobalamin (Cyanokit) 5 gm IV over 15 min
- ❑ High voltage electrical injury or direct lightning strike
 - LR or NS at 500 cc/hr (no bolus)
 - If diagnosed with rhabdomyolysis prior to transport, increase fluid replacement to keep urine output >2ml/kg/hr
- ❑ If signs of cyanide toxicity present:
hydroxycobalamin (Cyanokit) 70 mg/kg IV over 15 min
- ❑ High voltage electrical injury or direct lightning strike
 - LR or NS infusion rates (no bolus)
 - <5 years old: 125 cc/hr
 - 5-13 years old: 250 cc/hr
 - >13 years old: 500 cc/hr
 - If diagnosed with rhabdomyolysis prior to transport, increase fluid replacement to keep urine output >2ml/kg/hr

HEAD INJURY (TRAUMATIC BRAIN INJURY)

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ Cardiac monitor, CO2, and Pulse Oximetry monitoring when available
- ❑ **Treatment Plan**
 - Maintain airway. Administer oxygen to maintain SaO2 90-94%.
 - Consider spinal motion restrictions per the **Selective Spinal Immobilization Guideline**
 - Elevate head 30 degrees.
 - Monitor the level of consciousness during the transport
 - **Severe TBI** (GCS <8 or AVPU "P" or "U"):
 - Adult: Consider endotracheal intubation for airway protection (Paramedic only)
 - Pediatrics: Continue effective BVM. Utilize airway adjuncts, if needed to ensure adequate chest rise, ventilation, and oxygenation.
 - **Do not hyperventilate** unless patient shows signs of herniation: unilateral pupillary dilation or posturing. In this case, increase respiratory rate by ~10% above normal target respiratory rate (see Mild Hyperventilation Guide). Target ETCO2: 30-35 mmHg.

Mild Hyperventilation Guide for Signs of Herniation

| Age | Normal Ventilation Rate | Mild Hyperventilation Rate |
|---------|-------------------------|----------------------------|
| Neonate | 40 | 44 |
| Infant | 30 | 33 |
| Child | 20 | 22 |
| Adult | 10 | 12 |

- Open skull fractures should be covered with dry sterile dressings. Do not apply pressure unless needed to stop severe hemorrhage.
- ❑ **Key Considerations**
 - TBI may be painful. However, excessive pain medications can cloud serial neurological assessments. Pain medications should generally be avoided in a patient with altered mental status after TBI. If pain is severe, give small doses only until pain is manageable.
 - Patients with TBI may be confused or combative. Consider restraints if needed to protect patient or personnel.
 - Loss of memory, prolonged confusion or altered mental status associated with trauma may indicate a significant head injury.
 - Avoid hypoxia (SaO2 should be 90-94%).
 - Do not allow the patient to be hypotensive. Try and keep SBP >110 using the **Shock and Fluid Therapy Guideline**.
 - Pediatric lowest acceptable systolic blood pressures are birth to 1 month = 60mmHg, 1 month to 1 year = 70mmHg, 1 year to 10 years is = 70mmHg + (age x 2) and over 10 years = 90mmHg.

ADULT

PEDIATRIC (<15 years)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

AEMT

AEMT

- | | |
|--|--|
| <ul style="list-style-type: none"> ❑ Advanced airway, vascular access, and fluid therapy per IV/IO Access and Shock and Fluid Therapy Guidelines ❑ Check blood pressure every 5-10 minutes. ❑ Follow the Traumatic Brain Injury pressure management under the Shock and Fluid Therapy Guideline. | <ul style="list-style-type: none"> ❑ Advanced airway, vascular access, and fluid therapy per IV/IO Access and Shock and Fluid Therapy Guidelines ❑ Check blood pressure every 5-10 minutes. ❑ Initiate NS 20ml/kg for hypotension OR if unable to obtain blood pressure ❑ If hypotensive patient shows no improvement with initial treatment, may repeat NS 20 ml/kg up to a total of 60 ml/kg |
|--|--|

PARAMEDIC

- ❑ Persistent hypotension unresponsive to fluids

① **Epinephrine (1:1000) 2–10 mcg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.

And/or

① **Norepinephrine 0.3-3 mcg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.

PARAMEDIC

- ❑ Persistent hypotension unresponsive to fluids

① **Epinephrine (1:1000) 0.1–2 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.

And/or

① **Norepinephrine initial dose: 0.05 - 0.1 mcg/kg/min**, titrate to max of 2 mcg/kg/min to maintain SBP >70 + (age in years x 2) mmHg

HEMORRHAGE CONTROL, EXTREMITY AND CRUSH INJURIES

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
- ❑ **Treatment Plan**
 - Maintain airway, administer oxygen to maintain SaO₂ 90-94%.
 - Assess for deformity, swelling, tenderness, crepitus, open or closed fractures, hemorrhaging, lacerations, ecchymosis, instability, decreased function or pulses, loss of sensation of distal extremities.
 - **Epistaxis**: bleeding from the nose should be controlled by first having the patient sit and lean forward (unless there is a need for spinal motion restriction). Apply direct pressure by pinching the fleshy portion of the nostrils.
 - Cover lacerations or puncture wounds on the neck near the great vessels or trachea with an occlusive dressing.
 - **Crush syndrome** should be considered for the following patients:
 - Entrapped/compressed patients or limbs under a load for more than 30 minutes
 - Patients with little or no movement for more than 4 hours (e.g. older patient falls, overdoses, etc.)
 - Patients with crush syndromes are prone to cardiac dysrhythmias and electrolyte abnormalities. They should be placed on a cardiac monitor and the rescuer should be ready for possible cardiac arrest.
 - Cover **abdominal eviscerations** with a moist sterile dressing.
 - Do not attempt to replace organs.
 - Cover **extruded eye** or **deflated globe** with a moist sterile dressing and protective covering.
 - Do not apply pressure or attempt to replace in socket.
 - Cover both eyes.
 - In large, partially attached **avulsions**, the tissue should be returned to its' baseline position and stabilized whenever possible.
 - Elevate the limb such that the wound is above the heart.
 - **Impaled objects** should be stabilized in place and covered with dry sterile dressings. The exceptions would be:
 - Objects through the cheek where there is the possibility of airway compromise.
 - Objects that would interfere with chest compressions.
- ❑ **Extremity hemorrhage control:**
 - Apply direct pressure to the bleeding site, followed by a pressure dressing
 - If direct pressure/pressure dressing is ineffective or impractical:
 - If the bleeding site is amenable to tourniquet placement, apply a tourniquet to the extremity
 - If the bleeding site is not amenable to tourniquet placement (i.e. junctional injury), tightly pack the wound with hemostatic gauze followed by direct pressure and a pressure dressing.
 - Tourniquet should be placed 2-3 cm proximal to the wound, not over a joint, and tightened until the bleeding stops and the distal pulse is eliminated. If bleeding or distal pulse still present, place a second tourniquet proximal to the first.
 - For thigh wounds, consider placement of two tourniquets, side by side, and tighten sequentially.
 - When a tourniquet is initially placed to stop obvious severe hemorrhage, an attempt may be made to replace it with a pressure dressing after patient is stabilized. The tourniquet should NOT be removed/replaced if:
 - Transport time is short (less than 30 minutes)
 - Amputation or near-amputation
 - Unstable or complex multiple-trauma patients
 - Unstable clinical or tactical situation
- ❑ **Fractures/dislocations:**
 - Stabilize suspected fractures/dislocations
 - If distal vascular function is compromised, gently attempt to restore normal anatomic position. Pain medication should be considered prior to any manipulation.

- If extremity is deformed but vascular function is normal, splint in current position, to limit movement of suspected fracture.
- Elevate extremity above heart level, when possible, to minimize swelling.
- ❑ Treatment for pain and anxiety per the ***Pain and Anxiety Management Guideline***.
- ❑ **Key Considerations**
 - Tourniquets are painful and the conscious patient will likely require pain medication.
 - Commercial tourniquets are strongly preferred over improvised tourniquets.

ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

AEMT

- ❑ Advanced airway, vascular access and fluid therapy per ***IV/IO Access*** and ***Shock and Fluid Therapy Guidelines***
- ❑ For crush injury patients, when possible, initiate IV/IO access and consider administration of 1 liter NS bolus prior to release from entrapment

AEMT

- ❑ Advanced airway, vascular access and fluid therapy per ***IV/IO Access*** and ***Shock and Fluid Therapy Guidelines***
- ❑ For crush injury patients, when possible, initiate IV/IO access and consider administration of NS 20 mg/kg bolus prior to release from entrapment

PARAMEDIC

PARAMEDIC

NON-ACCIDENTAL TRAUMA/ABUSE

ALL PROVIDERS

- ❑ Scene and patient management
 - Contact Law Enforcement if someone on scene is a threat to themselves or others.
 - Separate any possible assailants, including parents, from the patient.
 - Remove patient from the stressful environment and remove any possible weapons.
 - Non-accidental trauma includes any act of commission or omission that results in harm to a person's physical, developmental, or emotional state.
- ❑ Focused history and physical exam
 - Blood glucose, Temperature and Oxygen Saturation assessment.
 - Always consider the possibility of abuse when evaluating any medical condition or trauma.
- ❑ Continuous cardiac monitor, ETCO₂, and pulse oximetry, when available.
- ❑ **Treatment Plan**
 - Suspect: Look for suspicious circumstances or actions from patient or caregiver
 - Listen to and document circumstances of the event.
 - Evaluate the environment in which you find the patient.
 - Protect: Be the patient advocate
 - Make all efforts to remove patient from the situation.
 - Respect: Communicate appropriately with family
 - Avoid confrontation with caregivers.
 - Be nonjudgmental and avoid accusations.
 - Consider law enforcement assistance.
 - Collect: Provide good documentation of incident.
 - Document using direct quotation when possible.
 - Document objectively without speculation.
 - Report: You have the responsibility to report suspected child or elder abuse and neglect to the ED **and also** to law enforcement or the Division of Family Services.
- ❑ **Key Considerations**
 - Non-accidental trauma, abuse, or neglect can occur in patients of any age and in all ethnic and socio-economic groups.
 - Risk factors include children under age of 5, the elderly, drug or alcohol abuse, and a history of domestic violence.
 - In children under the age of two the most common form of child abuse is **Abusive Head Injury (AHI)**. Mortality of AHI is 25%. For those that live, there is significant morbidity, usually associated with traumatic brain injury.
 - Do not directly engage a hostile patient, parent, assailant or perpetrator. If situation becomes unsafe for EMS personnel, call for police assistance.
 - If anxious or agitated, attempt non-pharmacological options to calm a patient. Consider pain and anxiety management per the ***Pain and Anxiety Management Guideline***.

SNAKE BITES

ALL PROVIDERS / EMT

- ❑ Focused history and physical exam
 - Identify and document the type of snake, appearance, location, and distinguishing marks.
 - Obtain an accurate time of injury.
 - Clarify any first aid provided by friends or family prior to arrival.
 - Coral Snakes in North America – “Red on Yellow = Poison Fellow, Red on Black = Safe with attack”.
 - Signs of envenomation include paresthesias, metallic taste, chills, nausea, vomiting, headache, dysphagia, cramps, hypotension, fever, local edema, blebs, and discoloration.
- ❑ Continuous cardiac monitor, ETCO2, and pulse oximetry, when available.
- ❑ **Treatment Plan**
 - Ensure scene safety by moving the patient to a safe distance, away from the snake.
 - Splint limb and place at the level of the heart.
 - Keep patient calm and movement to a minimum. You may need to treat for pain and/or anxiety to help achieve this goal per ***Pain and Anxiety Management Guideline***.
 - Remove items that may constrict swelling tissue, such as rings or bracelets.
- **Key considerations**
 - Do not start the IV in the affected limb.
 - Do not apply ice to the limb.
 - Do not try to capture the snake.
 - Do not bring a live snake to the ED.
 - Remember that snakes can reflexively envenomate up to 1 hour after death.
 - Pictures of the snake can be helpful.
 - Any snakebite can be dangerous and should be evaluated in the ED.
 - Watch for signs of shock and allergic reaction.

ADULT

PEDIATRIC (<15 years of Age)
NOTE: Pediatric weight based dosing should not exceed Adult dosing.

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy per ***IV/IO Access*** and ***Shock and Fluid Therapy Guidelines***

AEMT

- ❑ Advanced airway, vascular access, and fluid therapy per ***IV/IO Access*** and ***Shock and Fluid Therapy Guidelines***

PARAMEDIC

Persistent hypotension unresponsive to fluids

- ① **Epinephrine (1:1000) 2–10 mcg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.
- ① **Norepinephrine 0.3-3 mcg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >100 mmHg.

PARAMEDIC

Persistent hypotension unresponsive to fluids

- ① **Epinephrine (1:1000) 0.1–2 mcg/kg/min IV/IO** infusion for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg.
- And/Or**
- ① **Norepinephrine** initial dose: **0.05 - 0.1 mcg/kg/min**, titrate to max of 2 mcg/kg/min to maintain SBP >70 + (age in years x 2) mmHg

SELECTIVE SPINAL IMMOBILIZATION

ALL PROVIDERS

❑ Assessment

- Assess the scene, to determine the risk of injury. Mechanism alone should not determine if a patient requires cervical spine immobilization. However, mechanisms that have been associated with a higher risk of cervical spine injury are the following:
 - Motor vehicle collisions, including automobiles, motorcycles, ATVs, and snowmobiles
 - Axial loading injuries to the spine, such as diving accidents
 - Severe injuries to the torso
 - Falls >10 feet
- Assess the patient in the position in which he/she was found. Initial assessment should focus on determining whether or not a cervical collar needs to be applied.
- Assess for mental status, neurologic deficits, spinal pain or tenderness, any evidence of intoxication, or other severe/painful injuries

❑ Treatment Plan

- Immobilize the patient with a cervical collar if there is any of the following:
 - Patient complains of neck or spine pain
 - Any neck or spinal tenderness with palpation
 - Any abnormal mental status (including extreme agitation) or any neurologic deficit
 - Any evidence of alcohol or drug intoxication
 - Another severe or painful distracting injury is present
 - Torticollis in children
 - A communication barrier that prevents accurate assessment
- If none of the above apply, a cervical collar need not be placed on the patient, unless the treating medic otherwise feels there is a high risk of cervical spine injury.
- Patients with a penetrating injury to the neck should not receive spinal immobilization, regardless of whether they are exhibiting neurologic symptoms or not. Doing so can lead to delayed identification of injury or airway compromise and has been associated with increased mortality in such patients.
- Extrication:
 - From a vehicle: After placing a cervical collar, if indicated as above, adults and children in a booster seat should be allowed to self-extricate, if they are able. For infants and toddlers already strapped in a car seat with a built-in harness, remove the car seat and infant together, leaving the infant secured in the car seat.
 - Other situations requiring extrication: A padded long board may be used for extrications, using the lift and slide technique.
- Helmet removal: If a helmet needs to be removed, it is recommended to remove the face mask followed by manual removal (rather than the use of automated devices) of the helmet, while keeping the neck manually immobilized. Occipital padding should be applied, as needed, with the patient in a supine position, in order to maintain neutral cervical spine positioning.
- Patients should not routinely be transported on long boards, unless the clinical situation warrants long board use. An example of this may be facilitation of immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In these rare situations, long boards should be padded or have a vacuum mattress applied to minimize secondary injury to the patient. Pediatrics – use a pediatric specific backboard for those <8 years old OR use a towel or pad to raise the child's body (not their head) to insure appropriate spinal alignment on an adult board. Age <2 should be immobilized in a car seat or age appropriate papoose device.
- Assess neurological function before, during, and after application of Spinal Immobilization

❑ Key Considerations

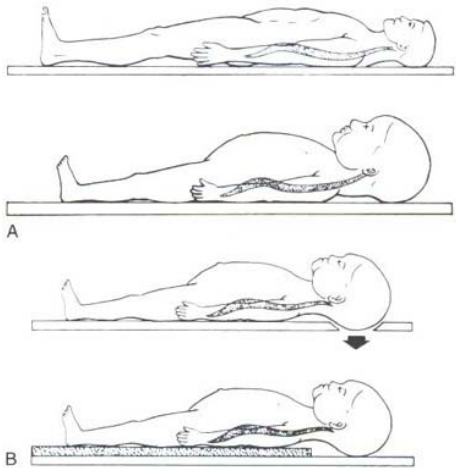
- Patients who are likely to benefit from immobilization should undergo this treatment.
- Patients who are not likely to benefit from immobilization, and who have a low likelihood of spinal injury, should not be immobilized.
- Patient should be "log rolled," with maintenance of spinal alignment, for examination of the spine for tenderness and deformities.
- Ambulatory patients who are alert and cooperative may be safely immobilized on a gurney with cervical collar and straps and will not generally require a spine board.

❑ Pediatric Considerations

- Age <2 should be immobilized in a car seat or age appropriate papoose device.
- Children who are <5 years old should be immobilized with an appropriately-sized cervical collar or soft towel rolls and tape, if tolerated. If attempts at immobilization result in more distress and fighting to get free, then the immobilization should be minimized.
- Children under the age of 8 cannot have their cervical spines reliably assessed in the field and should have a cervical collar placed if the mechanism or physical exam warrants it.
- Use a pediatric specific backboard for those <8 years old OR use a towel or pad to raise the child's body (not their

head) to insure appropriate spinal alignment on an adult board. (See figure below)

- ① Contact OLMC for further instructions if the patient refuses immobilization despite the provider's assessment for the need for spinal immobilization.



ADULT

PEDIATRIC (<15 years of Age)

NOTE: Pediatric weight based dosing should not exceed Adult dosing.

| |
|-----------|
| EMT |
| AEMT |
| PARAMEDIC |

| |
|-----------|
| EMT |
| AEMT |
| PARAMEDIC |